

Contents lists available at ScienceDirect

China Economic Review



Telecommunication externality on migration: Evidence from Chinese villages☆



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ARTICLE INFO

Article history: Received 10 July 2015 Received in revised form 22 February 2016 Accepted 29 March 2016 Available online 8 April 2016

JEL classifications: J2 015 050 Keywords: Landline phones Telecommunications Migration Network effect Psychological costs

1. Introduction

China

ABSTRACT

We use a unique data set of Chinese villages to investigate whether access to telecommunications, in particular, landline phones, increases the likelihood of outmigration. By using regional and time variations in the installation of landline phones, our difference-in-difference estimation shows that the access to landline phones increases the ratio of out-migrant workers by 2 percentage points, or about 51% of the sample mean in China. The results remain robust to a battery of validity checks. Furthermore, landline phones affect outmigration through two channels: information access on job opportunities and especially timely contact with leftbehind family members. Our findings underscore the positive migration externality of expanding telecommunications access in rural areas, especially in places where migration potential is large.

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The past decades have witnessed a surge in intranational migration. In the past three decades in China, 500 million people have flocked to the city, and during the period of 2000 to 2010 alone, China's urban population had expanded by 210 million (Wong, 2012). Outmigration is generally found to profoundly contribute to the welfare of both the recipient and sending destinations. Beegle, De Weerdt, and Dercon (2008), for instance, find that migration between 1991 and 2004 increased consumption growth rate in Tanzania by 36 percentage points. Despite the significant economic benefits, however, there are still substantial barriers to labor mobility. Why do so many potential migrants fail to act out their wishes? How can we facilitate outmigration?

The literature on the determinants of migration, starting from the classical Harris and Todaro (1970), emphasizes the ruralurban earning differentials as the key reason. Moreover, scholars recognize that a fundamental problem in migration is uncertainty. Potential migrants do not have full information about job opportunities, wages, and the quality of life in destination cities, and new evidence on migrants' expectations in developing countries suggest how inaccurate these expectations can be (McKenzie, Gibson, & Stillman, 2013). The literature has recognized and provided evidences that an important way to reduce information

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http://dx.doi.org/10.1016/j.chieco.2016.03.007 1043-951X/© 2016 Elsevier Inc. All rights reserved.

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problems is through the channel of networks (Barr & Oduro, 2002; Hanson & McIntosh, 2010; Kilic, Carletto, Davis, & Zezza, 2009; McKenzie & Rapoport, 2010; Munshi, 2003; Uhlig, 2006; Winters, de Janvry, & Sadoulet, 2001; Yamauchi & Tanabe, 2008). The literature also suggests that fast-changing information technology and its associated exposure on urban life would change the quality of information received by potential migrants and, therefore, their migration decisions. For instance, individuals exposed to foreign media and social media are more likely to migrate (Braga, 2007; Komito, 2011). Access to mobile phones increases the probability and intensity of rural–urban migration by offering more information about the labor market at the destination (Aker, Clemens, & Ksoll, 2011; Muto & Yamano, 2009).¹ Moreover, the impact of mobile phone coverage expansion on migration depends on personal networks: the expansion of a mobile phone network strengthens the effect of the existing ethnic network on migration (Muto & Yamano, 2009, 2011). But better information does not uniformly encourage migration—it depends on whether potential migrants over- or under-estimate the prospects of the potential destinations. If potential migrants over-estimate their employment and life prospects in the destination region, better access to information may decrease migration, as found by Farre and Fasani (2012).

In this paper, we investigate whether the availability of information technology, in particular, the access to in landline phones, can loosen the constraints on potential migrants and lead to an increase in outmigration. How does access to telecommunications affect outmigration? We consider two reasons. First, telecom access allows potential migrants to access information on external labor markets, which substantially reduces their searching costs and increases the accuracy of their costs-benefits analysis of migration decisions. Second, telecom access allows migrants contacts with their left-behind family members conveniently and timely, which substantially reduces the psychological costs of migration. This is especially important in China because of the prevailing policies limiting access to education and health care by migrants at destination cities, which results in adults largely leaving their families and migrating alone (Wong, 2012; World Bank and DRC, 2014).

Using the *National Fixed Point Survey* conducted by the Ministry of Agriculture of China in 1993 and 1995–2000, we exploit regional and time variations in the installation of landline phones to identify the causal effect of landline phones on outmigration. Out of 61 villages in our sample, 35 had landline phones in 1993 (i.e., our initial year), 23 installed landline phones at different times during the sample period, and 3 remained without access to landline phones by 2000. Meanwhile, other telecom technologies, such as mobile phones and the Internet, only started to penetrate in the late 1990s and mostly in rich and coastal cities. Hence, our research setting allows us to separate the effect of landline phones from other competing telecom technologies. Furthermore, our identification is aided by directly controlling for the exposure to other information sources, such as newspapers and televisions. An important advantage of relying on landline phones to identify the effects of telecom is that we face a less serious challenge of endogeneity. Individuals can purchase mobile phones, and the access to mobile phones is closely related to personal ability, wealth, and demand for modern technology, which may be strongly related to the migration decision. In contrast, the installation of landline phones at the village level, as we document later, was largely related to several easily observable variables, and thus, its endogeneity for migration can be more easily handled, and not surprisingly, our estimates of the telecom effects on migration are quite stable.

Based on the difference-in-difference (DID) approach, we find that the installation of landline phones leads to an increase in the ratio of out-of-province migrant workers in total rural labor force by 1.5 to 2 percentage points, or 38.5 to 51% of the sample mean. The results are robust to a battery of validity checks, such as using DID coupled with matching, using a weighted regression, controlling for pretreatment effect, and using a flexible estimation method to account for differences in the time trend in outmigration of the treatment and the control groups. Two placebo tests also confirm our identification assumptions. First, if the telecom effect merely reflects the time trend in relatively rich villages, then villages always with telecom access should have higher migration trends, but we find a similar trend in the migration levels for villages always with telecom access and those never with telecom access. Second, if the telecom effects on outmigration reflect mechanisms other than the information or timely contact with left-behind families (as we hypothesize), telecom access will likely affect out-of-village, within-county migration, but we do not find that telecom access affects such short-distance migration.

We further shed light on our two proposed mechanisms through which landline phones may increase outmigration, that is, information access and timely contact with left-behind family members. We find that the positive effect of landline phones on outmigration is greater for villages with a larger pool of previous out-migrants (a proxy for the information access through the network effect) and for villages with more non-labor population (a proxy for left-behind family members).

Our paper contributes to the literature of migration in several ways. First, by using unique data on landline phone installation and by taking advantage of the predictive nature of landline phone installation at the village level, we have a transparent and plausible strategy for identifying the effects of telecom on migration. The robustness of the results under a variety of specification checks renders support to the plausibility of our identification strategy. Second, our evidence comes from the country that has experienced the largest migration in the world and in the periods in which the migration process was in full swing (World Bank and DRC, 2014), and it is useful to know whether modern telecom has had quantitatively important impact on migration. We find it is so. Third, there is little evidence of how family structure and psychological costs of migration affect migration, and in this paper, our results suggest that modern telecom may reduce the psychological costs of migration by allowing migrants to stay in touch with their family members left behind in the villages.

¹ For studies looking at how mobile phones reduce market information asymmetry in general, see Jensen (2007); Aker (2010), etc.

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